AMERICAN

SEPTEMBER • 1954

Cinematographer

THE MAGAZINE OF MOTION PICTURE TECHNOLOGY

In This Issue . . .

- MGM's NEW UNDERWATER CAMERA BLIMP
- TV SERIES FILMED IN 16MM COLOR
- SYNC SOUND WITHOUT INTERLOCK

25
$3.00 YEAR

Shooting that helps save lives

DALLAS POLICE REPORT EXCELLENT RESULTS WITH DU PONT FILMS DESPITE UNPREDICTABLE LIGHTING AND WEATHER

Plagued by a high accident rate, the Dallas Police Department made a series of safety movies on the importance of careful driving. For the most part, shots of actual traffic accidents were used. The movies were made on Du Pont Motion Picture Film.

Taking this real-life footage is seldom easy. Day or night, the police photographer must be prepared for cloudy weather, heavy fog . . . even driving rain. And regardless of time of day, there's always the problem of lighting. That's why the versatility of Du Pont Film is so important for these operations. It's proved ideal for television broadcasting of these safety films, too.

No Chance for Retakes

Many of these motion pictures are designed to train rookies. One that shows the rights and wrongs of directing traffic, for example, has been so successful that other police departments have copied it. However, in making these films there's often no opportunity for reshooting scenes and the consistency of Du Pont Film from reel to reel naturally proves valuable.

Used Normal Indoor Lighting

Another film made by the Department teaches merchants and salespeople how to apprehend swindlers and shoplifters. It was shot under normal retail-store lighting without a single auxiliary light. Yet every frame was bright and clear, thanks to the high speed of Du Pont Motion Picture Film.

Both Du Pont 930A and 931A offer wide latitude, excellent definition. And their high speed plus longer tonal range make them ideal for semi-professional motion pictures and TV news releases. For more information, write your nearest District Office or: E. I. du Pont de Nemours & Co. (Inc.), Photo Products Department, Wilmington 98, Delaware. *In Canada: Du Pont Company of Canada Limited, Montreal.*

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Great equipment makes great cameramen . . . . .

BALANCED TRIPOD HEAD

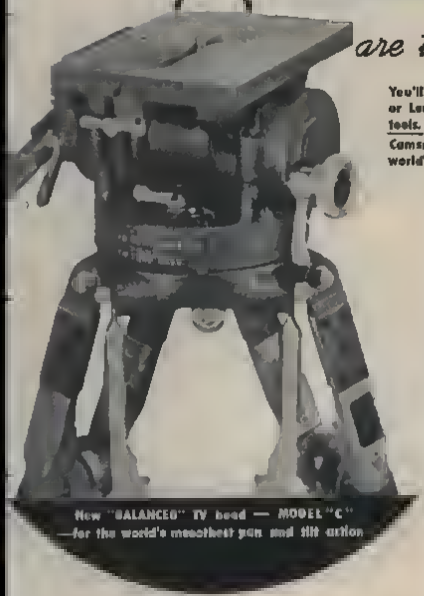
and

PROFESSIONAL JUNIOR TRIPOD

are the standbys of the masters

You'll never hear Fritz Kreisler playing on a scratchy fiddle . . . or Louis Armstrong on a $7 trumpet. Good craftsmen need good tools.

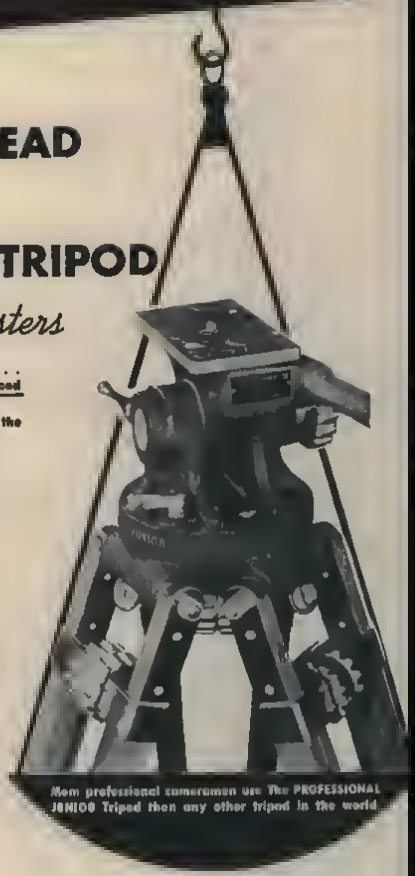
Camera Equipment Company makes, sells, services and rents the world's finest quality TV and Motion Picture Equipment.



New "BALANCED" TV head — MODEL "C" —for the world's smoothest pan and tilt action

SYNCHRONOUS MOTOR DRIVE — 110 Volt AC — Single phase, 60 Cycle. Runs in perfect synchronization with either 16mm or 35mm Sound Recorders. Mounting platform permits removal of magazine while camera remains mounted on motor. Spring steel drive tie coupling prevents damage if film jam occurs.

Knurled knob on armature permits rotating for threading. "On-Off" switch in base. Platform base threaded for ¼" or ⅜" tripod tie-down screw. Rubber covered power cable with plugs included.



Most professional cameramen use The PROFESSIONAL JUNIOR Tripod than any other tripod in the world.

No more groping for meter of gravity. The new Model C "Balanced" Tripod Head is equipped with a convenient, accessible positioning handle mounted below the top plate, which allows the operator to reposition the camera to the correct center of gravity. No matter what focal length lens is used on the camera turret, the camera can be balanced on the Model C Head without loosening the camera tie-down screw.

It has all the features which have made the "Balanced" head a gem of engineering ingenuity—quick release pan handle, tilt-tension adjustment to suit your preference. It's a Cameraman's dream!

Let's face it. You need a first class tripod to make better pictures. PROFESSIONAL JUNIOR has the rigidity, the range, and the ease of operation that better pictures demand. See it—try this tripod beauty—and you'll never be without it.

PROFESSIONAL JUNIOR TRIPOD—Friction Type. Handles all 16mm cameras, with or without motor. Also 35mm DeVry, B & H Eyemo with and without motor, and 400' magazines. Tripod base interchangeable with Professional Junior gear drive head. "Baby" tripod base and "Hi-Hat" base available.

FRANK C. ZUCKER

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1600 BROADWAY NEW YORK CITY

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Complete line of 35mm and 16mm equipment available for rental.

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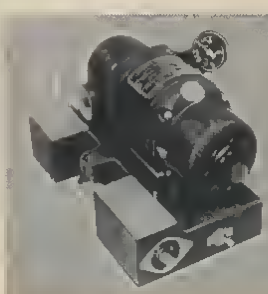

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We calibrate lenses—Precision "T" Stop Calibration of all type lenses, any focal length. Our method is approved by Motion Picture Industry and Standard Committee of SMPTE. For proper exposure density, it is important that you have your lens "T" stop calibrated. Lenses coated for photography.

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AMERICAN
Cinematographer

THE MAGAZINE OF MOTION PICTURE PHOTOGRAPHY
PUBLICATION OF THE AMERICAN SOCIETY OF CINEMATOGRAPHERS

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ON THE COVER

PHOTOGRAPHING underwater scenes for MGM's "Jupiter's Darling" at Silver Springs, Florida. Camera operators Dale Deverman and John Nicko laus make last-minute check of blimped cameras before giving "ready" signal to director of photography Paul Vogel, A.S.C. Production, which stars Esther Williams, was directed by George Sidney (See story on Page 40).—*Photo courtesy Florida's Silver Springs.*

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"I feel I owe you this letter..."

DON MALKAMES
Cinematography- Mitchell Cameras
7 PLYMOUTH AVENUE
TUCKAHOE 7, N. Y.

June 11, 1954

Mitchell Camera Corp.,
666 West Harvard St.,
Glendale 4, Calif.

Gentlemen:-

I feel that I owe you this letter.

Since purchasing my Mitchell BNC camera from you in January 1951, more than two million feet of film has been exposed in it, in the production of over two hundred television shows.

During the entire photographing of this footage, we have never had a buckle, a scratch or an abrasion mark on the film. We have never experienced the slightest mechanical trouble and not a single screw has been adjusted since the camera left your hands, at the factory. The only times that even a screwdriver has touched the camera have been when I personally removed the movement, once each month, cleaned it in benzine, and replaced in camera.

My experience with the above camera upholds the reputation of the original Standard Mitchell Camera which I purchased from you more than twenty eight years ago and which is still in use, along side of the BNC, making 'wild' shots.

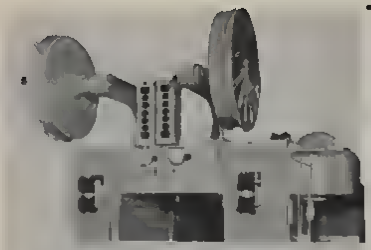
Sincerely,

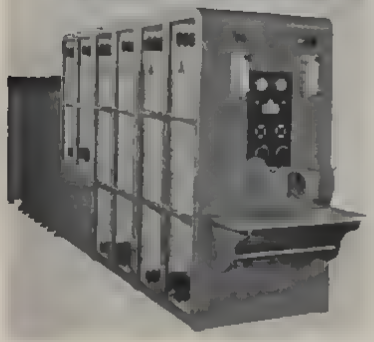
Don Malkames

Mitchell Camera CORPORATION

666 WEST HARVARD STREET·GLENDALE 4, CALIFORNIA·CABLE ADDRESS: (MITCAMCO)

65% of the motion pictures shown in theatres throughout the world are filmed with a Mitchell





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Highest workmanship, famous machine-building tradition favorable cost schedules, and profitable exchange rates between American and German currencies offer *you* top quality color developing machines at really *spectacular prices*

Pictured is UNION'S Model 351/V, a sprocket driven machine, for
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THE UNION COLORA DEVELOPING MACHINE . . .

Duplex type each side with its own tanks, motor and speed control. 35/16mm combination rollers and combination sound track applicators. Speed 100 ft. per minute per side, based on maximum developing time of 14 minutes, (higher speeds with shorter development time) This means a capacity of at least 200 ft per minute!

Other features of this machine include a bottom friction drive, air recirculation with refrigeration type dehumidifier, and automatic temperature control

$43,522

f.o.b. Hamburg, Germany

Add approximately $10,000 for import duties and freight, and the price is still far below competitive offers.

For complete, detailed information, write, wire, phone

UNITED MOVIE TECHNICIANS, INC.
324 Union Street, Hackensack, N. J.
Diamond 2-0597

HERE'S SOUND ADVICE!

If the confusion that surrounds the various sound systems being offered today has delayed your decision on just what you should install in your theatre, consider these facts:

Three of the majors — M-G-M, Paramount and Warner Brothers — have already announced that *all* future productions will have Perspecta Stereophonic Sound. Other studios are following their example.

Why has Perspecta Stereophonic Sound been chosen as standard — a standard certain to remain for years to come? For three very good reasons:

1. The movie industry wants to make money. To do this they know they must keep your box-office busy. Perspecta Stereophonic Sound will do just that by giving the movie-going public the dramatic realism they want.

2. Perspecta Stereophonic Sound is a system every movie exhibitor can afford to install.

3. Perspecta Stereophonic Sound Track operates identically with the optical sound track you've been using for years except for the inclusion of three low-level, low-frequency tones "heard" only by the Integrator, which automatically controls volume and direction for true stereophonic effect.

The Perspecta Stereophonic Sound Integrator, design-engineered by Fairchild, makes this system available to you at a price you can afford. Only one Fairchild Integrator serves all projectors in the booth — controls Perspecta Stereophonic Sound through any 3-channel sound system of standard make. And projector modifications are not required.

Call, wire or write *now* for full information on your specific theatre sound problem.

FAIRCHILD RECORDING EQUIPMENT
MOTION PICTURE SOUND DIVISION • WHITESTONE 57, NEW YORK

Industry NEWS

The New Vista-Vision camera, designed and manufactured by the Mitchell Camera Corporation, Glendale, Calif., is in production and deliveries are scheduled to start in the near future. First deliveries will be made to Paramount Studios in Hollywood, where Vista Vision had its inception. The new camera is expected to be used by a number of other major studios

★

Nippon Kogaku, Japanese manufacturers of the Nikon line of cameras and optical goods, is now supplying theatres in this country with CinemaScope projection lenses

★

D. J. White, President of Magnasync Mfg. Co., Ltd., recently concluded a franchise agreement with Henri A. Lube, President of Cuauhtemoc Studios in Mexico City whereby latter will handle distribution of Magnasync equipment in Mexico.

★

Technicolor Motion Picture Corp. has developed a modified process for shooting TV films and has demonstrated it to a number of video film producers. The corporation reportedly will soon announce a new low-cost camera and a single-strip color film for TV film production.

★

W. J. German, Inc., agent and distributor for Eastman motion picture films, last month moved to new quarters at 6677 Santa Monica Blvd., Hollywood William J. German, president, flew in from New York to be on hand for the opening ceremonies

★

Technical Services, Inc., Livonia, Michigan, manufacturers of continuous projectors and special devices, has purchased all tools, spare parts and completed inventories of the DeVrylite 16mm sound motion picture projector.

★

Ralph Chapman, who built the largest camera crane used in Hollywood, has built a new and even larger mobile electric crane. It was given its initial big production tests by RKO in location shooting in Utah for "The Conqueror."

Crane has two motors: gasoline for highway travel and exterior shots, and electric for sound stage use.

Perfect Balance!

SMOOTHER, EASIER TV CAMERA CONTROL

NEW

HOUSTON-FEARLESS

CRADLE HEADS

Perfect camera control is the difference in the terrific new Houston-Fearless Cradle Heads! No matter how the camera is tilted, it stays in absolute balance .. resulting in unprecedented ease of operation and remarkable smoothness never before achieved.

This perfect balance is made possible by the cradle action of the head. When the camera is tilted up or down, the camera rotates around a constant center of gravity, maintaining positive balance at all times. Added weight such as long lenses and camera accessories, is easily compensated for by simply moving the camera and the top plate of the head forward or back by means of a lead screw. This adjustment does not require loosening the camera hold-down screws.

The Cradle Head rides on four phenolic covered ball bearing rollers for smooth, quiet, easy tilting. Panning is also smooth and easy, accomplished by two precision ball bearings in the base. Drag adjustments and brakes are provided on both pan and tilt.

FOR MONOCHROME AND COLOR TV CAMERAS

The new Houston-Fearless Cradle Heads are available in two types. Model MCH for standard black and white cameras. Model CH-1 for the RCA Color TV camera.

Like all Houston Fearless products, these new Cradle Heads are soundly engineered and precision built of the finest materials to give a maximum of dependable service. Send the coupon below for complete information today.

The **HOUSTON FEARLESS** *Corporation*

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"World's Largest Manufacturer of TV Studio and Motion Picture Film Processing Equipment"

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[illegible] VE., NEW YORK 20,

Another triumph for Kinevox, too!

VARIETY Fri., Aug. 6, 1954

OPEN LETTER TO LOUIS HAYWARD

Mr. Louis Hayward
c/o California Studios
570 No. Brensen Ave.,
Hollywood 4, California

Dear Louis:

Remember a very short time ago, when we went into partnership with you in a business called television? Remember the many hours spent processing material? Remember selecting the Louis Vance "Lone Wolf" character as your vehicle? Of course you do. We even remember your words, "I hope we've made the right decision."

Well, today, the jury brought in its verdict and our decisions were proved correct. In a phenomenally short period of time audiences have taken to their hearts our series, and your portrayal of Michael Lanyard. In the recent poll conducted by Billboard many honors were accorded you and the show, notably:

"WOLF" PLACED SECOND FOR THE BEST NEW SERIES REGARDLESS OF PROGRAM TYPE OR HOW SOLD.

And, as for yourself, the audiences, who for so long bought tickets to see your pictures, are now turning a dial and watching you in their homes. In just 10 weekly television shows, Louis, you accomplished the following:

WRAPPED UP SECOND PLACE LAURELS AS THE BEST ACTOR APPEARING REGULARLY IN A NON-NETWORK MYSTERY FILM SERIES.

We offer to you, our producer Donald Hyde, and to all the others who have contributed to the "Lone Wolf" success, our sincere and heartfelt congratulations.

Cordially,

Jack Gross *Phil Krasne*

P. S. Also, Partner, Billboard had this to say: "'Lone Wolf' the show which stars Louis Hayward, is a dark horse because it has only been on the market for a few months and is rated one of the best."

P.P.S. - The Sound was recorded with Kinevox equipment, of course!

KINEVOX, INC.
Burbank, Calif.

WHAT'S NEW

. . . in equipment, accessories, service

Tightwind Adapter

Camera Mart, Inc., 1845 Broadway, New York 23, N. Y., announces a new device which aids in rewinding 16mm or 35mm film on cores and without using reels or flanges. Tradenamed the Camart Tightwind Adapter, it fits over most standard rewinds and is complete with core adapter.

Adapter permits winding short lengths of film quickly, tightly and evenly; need for separate tightwinders is eliminated.

As pictured here, adapter fits over any Neumade or Moviola rewind. No machining or other alterations to rewind are necessary. Unit may be readily detached. Price is $24.00

Hi-Hat For Arriflex

Kadisch Camera & Sound Engr. Co., 500 West 52nd St., New York 19, N. Y., offer a lightweight hi-hat for the Arriflex 35mm camera. It can be used on any tripod or mounted on any other support. The hi-hat features a special dovetail for attaching accessories such as sunshade, TV effects

(Continued on Page 430)

COLOR-CORRECT* RELEASE PRINTING from separate track and picture masters incorporating "A" and "B" effects

1¢ per foot

- Color Duplicating Stock furnished at cost if payment accompanies order — $.058 per foot.
- We will mount all prints on your reels and cans at no extra charge — and pack for shipping anywhere in the world.
- Delivery to meet your schedules.

Reg. U.S. Patent Office

byron *Studios and Laboratory*

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in the East...

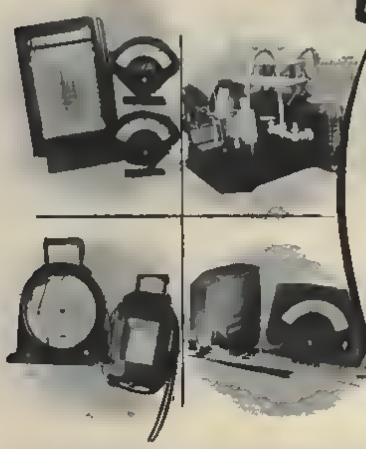
... it's

MOVIELAB

The superior QUALITY CONTROL consistently maintained by MOVIELAB on all film processing assignments has earned it the jealously-guarded reputation of being the "QUALITY LABORATORY" in the east.

More producers, cameramen and technicians throughout the east put their trust into Movielab's "KNOW-HOW" and "personalized service" than any other.

Get to know Movielab—for this is the standard by which all film processing is judged.



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619 West 54th Street, New York 19, N. Y. JUdson 6-0360

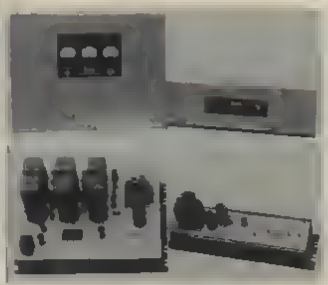
WHAT'S NEW

(Continued from Page 428)

unit, telephoto lens bed, or cradle for a CinemaScope lens. For price and further details, write manufacturer direct.

Brownie Movie Light

Eastman Kodak Company, through its many retail distributors offers a new, inexpensive light bar for use in shooting indoor or after-dark movies. Fixture which is readily attachable to any cine camera by means of a tripod socket screw, accommodates two 375-watt reflector flood lamps. With the light source thus attached to the camera, the photographer can then follow subject action, through the finder, in the normal way. There is no problem of changing exposure because the light follows the action. The Movie Lite retails for $5.55, the lamps, $1.35 each.



Stereo Sound Integrator

Fairchild Recording Equip. Co., Whitestone, L. I., New York, announces a new model of its Perspecta Stereophonic Sound Integrator, previously announced here in our July issue. Designated as Model 315C, new version consists of standard Perspecta Integrator and Power Supply mounted on vertical chassis of the recessed type, said to be ideal for mounting in theatre installations where space is at a premium.

The HANK McCUNE TV Show

filmed by
TED ALLAN Studios

...in **COLOR** with the

AURICON "SUPER 1200"

16mm Sound-on-Film Camera!

NAVY STORY

Filmed at Destroyer Base Reception Center, San Diego, California, with cooperation of the United States Navy

FANTASY

Dream scene from 'Aladdin and the Magic Lamp" story in the Hank McCune TV Show Series

Ted Allan, veteran Hollywood Photographer of the Stars, is one of the many professional film producers whose first choice for dependable television filming of the highest quality, is an Auricon 16mm Camera.

The "Hank McCune Show," a comedy series soon to be seen by millions over national TV networks, is being filmed in natural color with the "Super 1200" Camera. Ted Allan says, "45,000 feet of film have been run through the Auricon Camera without a film-scratch or loss of a foot of film!"

Write for your free copy of the complete Auricon Catalog, which includes the "Super 1200" Camera, a superb photographic instrument. Sold with a 30 day money-back guarantee, you must be satisfied!

AURICON

BERNDT-BACH, INC.

6902 Romaine Street, Hollywood 38, Calif.

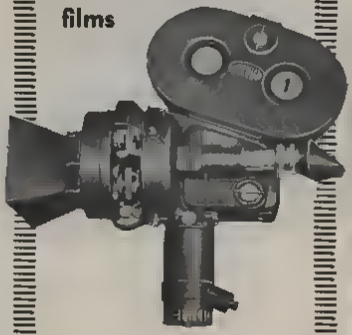
The Auricon Hollywood Line

ARRIFLEX

New 35 mm Model 2A
With 180° Shutter

A TRULY GREAT CAMERA

for TV, Newsreel and commercial films



Far taugh and trying assignments, ARRIFLEX 35 is in a class by itself Reflex focusing through photagraphing lens while camera is operating—this is just ane autstanding ARRIFLEX feature.

Equipped with bright, right-side-up image finder, 6½ x magnificatian. Salves all parallax prablems. 3 lens turret. Variable speed motor built inta handle aperates from lightweight battery. Tachameter registering from 0 to 50 fromes per second. Compact, lightweight for either tripod ar hand-held filming. Takes 200' ar 400' magazine. Write for free falder.

Blimp now available.
16mm ARRIFLEX also available.

FRANK C. ZUCKER
CAMERA EQUIPMENT CO.
1600 BROADWAY NEW YORK CITY

letters

Cover Clicks

That was a swell cover photo you had on the August issue—lots of details for readers to study which show just how professional movies are made One thing I noticed particularly was the microphone extended out over the players With the sun directly over head, it must have cast a mike shadow in the scene Wouldn't the camera pick this up?

Ray Harris,
Chicago, Ill.

Look at position of camera in the photo and you'll note it is shooting a closeup, therefore would miss any shadows on ground. Also, mike is not directly over heads of players, so no shadow fell on them.—ED.

In the cover photo, your August issue, it shows booster lights used to supply fill light on what appears to be a very bright and sunny day. Why didn't cameraman Metty use sunlight reflectors instead?

J. H. Ballinger,
Harrisburg, Penna.

The booster lights give much better results than reflectors—more even light, better quality They are used on location whenever power is available to light them; otherwise, reflectors are used.—ED

Hot Splicer

Relative to Hank Stockert's article, "Hot Splicer Conversion," on page 348 of your July issue, I want to say that Mr Stockert went far afield to accomplish his purpose and I doubt very much whether his idea will work satisfactorily. The simplest method for accomplishing the same result involves nothing more than installing a 7- or 12-watt miniature lamp and socket in the base of the splicer, plus a toggle switch to turn off the juice when the base becomes warm enough

It is not wise to keep the heat on any splicer continuously because the latest film cements set too quickly. My experience has shown that the only time a heated splicer is needed is in winter months or in very humid atmospheres. This is especially true when working with 35mm film

I hesitate to break into anything like this, but I feel that I was the originator of heating the Griswold splicer, both 16mm and 35mm, and I should therefore bring this to your attention.

L. H Georger,
Buffalo, New York.

Answer to a Letter

Sam Sancenito, whose letter requesting interlock plans appeared in this column in your August issue. may be interested in the book "Photographic Amusements" by Frank R Fraprie. The book deals with trick photography and one chapter in the edition which I read gives instructions but no illustrations, for building and using a 16mm optical printer. By the way, your August issue is the most informative I can remember seeing.

Chuck Anderson,
Burlingame, Calif.

Kudos from an Amateur

I am an amateur movie maker who reads American Cinematographer regularly for the instructional material it contains for the non-professional as well as the professional.

That was a very inspirational article in the last issue by Charles W. Herbert on the subject of big game fishing. Please give us more like it!

Hal Sterling,
Seattle, Washn.

A and B Rolls

In Charles L. Anderson's article in your August issue, he refers to an article "How to Edit A and B Rolls," which appeared in an earlier issue of your publication. Can you supply extra copies of this issue?

Gus T. Hansen,
Milwaukee, Wisc.

Hope you can air mail a copy of the April, 1950 issue of American Cinematographer to me, which contains the instructional article on editing A and B rolls. Do you also have reprints of this article available?

Dave Jennings,
Denver, Colorado.

No reprints are available. but back numbers of the April, 1950. issue of AC, are available at 30 cents per copy.—ED.

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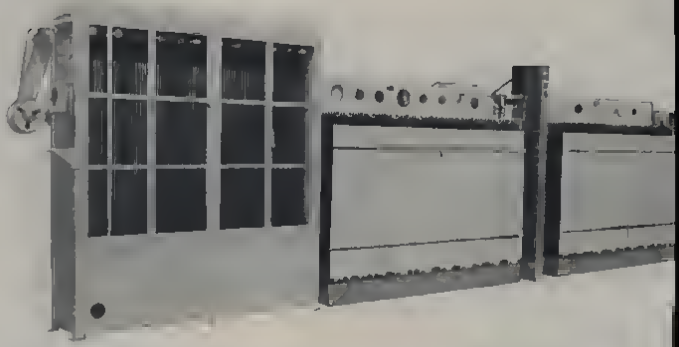

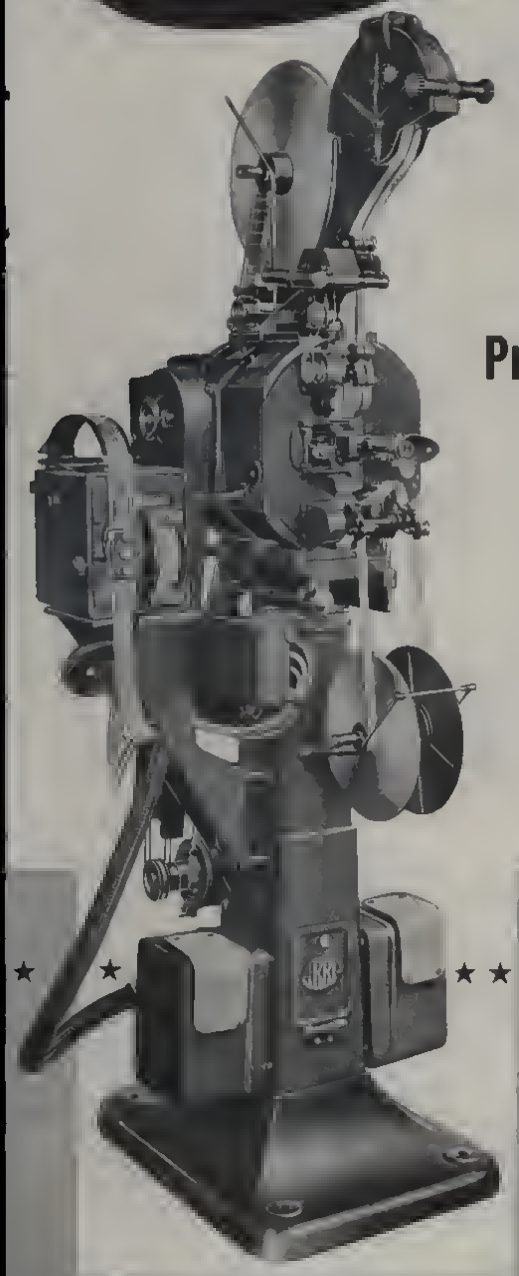

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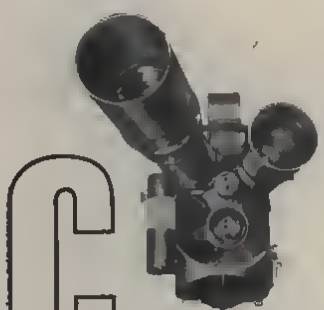

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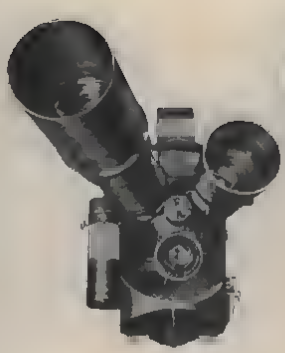

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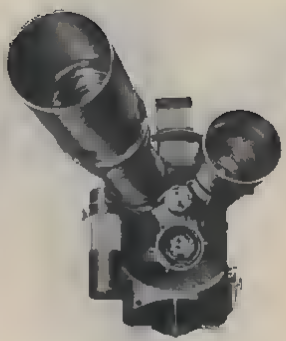
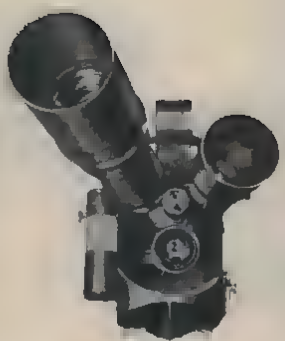
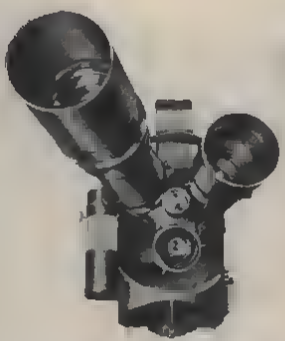


reflex viewing



divergent turret



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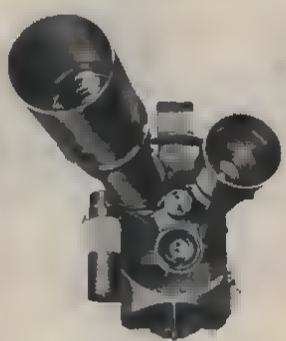

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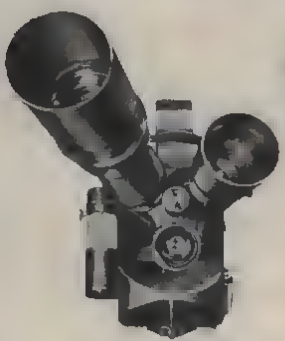

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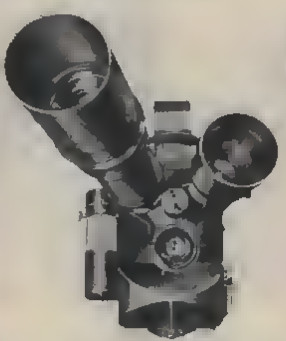

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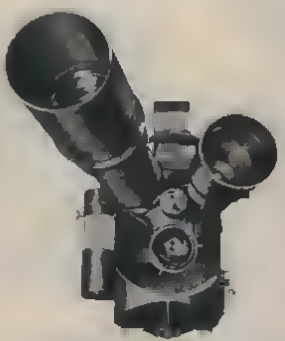

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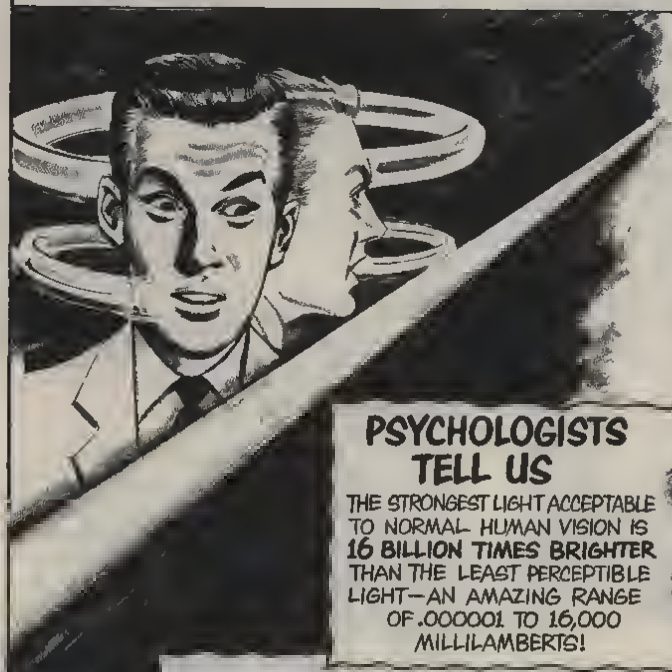

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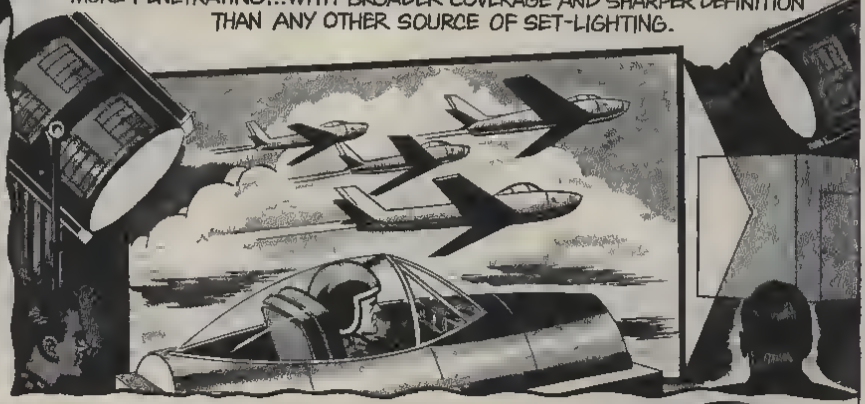

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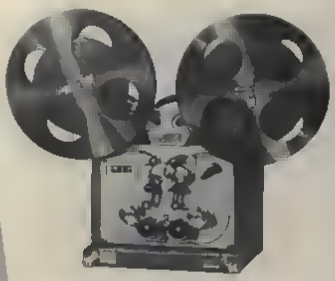

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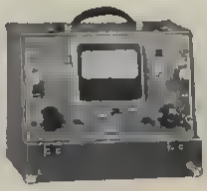

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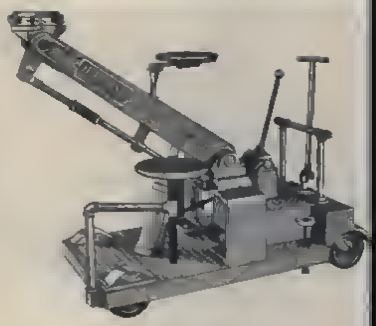

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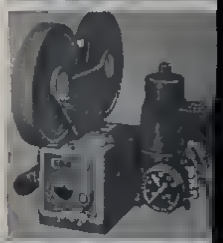

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RUNNING A TAPE before starting to shoot a scene for MGM's "Jupiter's Darling" at Silver Springs, Florida. The two underwater blimps house Mitchell cameras with 1,000-foot magazines. One camera shoots CinemaScope, the other wide-screen. Camera operators are Dale Deverman and John Nickolaus. Both wear regulation Aqualungs which enables them to work underwater with the cameras with almost the same ease as when above surface. —Photo courtesy Florida's Silver Springs

MGM's New Underwater Camera Blimp

Said to be most advanced of any yet designed for a 35mm camera, this blimp requires no tripod or other support under water, takes Mitchell cameras having 1,000-foot film magazines.

By ARTHUR ROWAN

PRODUCTIONS requiring underwater sets and photography are being made with increasing regularity by Hollywood studios. To facilitate the underwater shots, most of the studios have constructed their own underwater camera blimps. Perhaps the most interesting of these was the blimp which John Arnold, A.S.C., head of the camera department at MGM studio, designed for the Mitchell cameras that were used in filming underwater scenes for the studio's recent production, "Jupiter's Darling," starring Esther Williams.

This production included, perhaps, the greatest amount of underwater footage of any yet filmed by the studio. Underwater scenes were photographed in the huge tank on the studio lot, and at Silver Springs and Weeki Wachee, Florida.

At Silver Springs, MGM erected what was probably the world's largest and most costly underwater set. The set was assembled at the studio, then dismantled and shipped to Silver Springs where it was re-assembled beneath 30 feet of water. The set consisted of a wreck of an ancient Roman Galley, and was complete in detail, including artificial studio-made moss, seaweed and rubber barnacles. On the floor of the set were treasure chests and ancient urns. Here Esther Williams was pursued by three husky Roman soldiers as two cameras—one with a CinemaScope lens and the other shooting wide-screen — recorded the action on Eastman Color negative. Each camera was protected by a monstrous and formidable-looking all-metal blimp which you see pictured on these pages. Paul Vogel, A.S.C., directed the photography, aided by operators Dale Deverman and John Nickolaus.

John Arnold's original design for the camera blimp included a motor driven propellor and a rudder intended to fa-

cilitate mobility of the blimp underwater However, in actual use, it was found unnecessary to add these features, for when the blimp attained neutral boyancy, thanks to automatically regulated air pressure, it is as easy to maneuever as though it weighed but one pound instead of the several hundred pounds that it does.

The blimp is said by studio engineers to be the most advanced of any yet designed for use with 35mm cameras. For one thing, it is the only blimp so far designed and built that permits use of cameras with 1000-foot film magazines. This feature alone proved a tremendous time-saver when filming at Silver Springs, where the camera was often used at a depth of fifty feet. There were days when it was never necessary to re surface in order to reload the cameras with film; the single thousand-foot load took care of the entire day's shooting.

Although we have mentioned here only one blimp, actually two were constructed and used for this picture—one for the camera having a CinemaScope lens, and the other which encased the camera shooting wide-screen. The last-named blimp with camera and batteries weighs 472 pounds; the one for CinemaScope, which requires additional mechanical controls and other features, weighs 510 pounds with camera and batteries. Boyancy of the blimps has been so engineered that these great weights are neutralized once the blimps are submerged.

The main body segments of each blimp are of cast aluminum. These are bolted together and have rubber gaskets protecting the seams. At the front is a large door supported on heavy brass hinges with a window of heavy optical glass through which the camera shoots the scene.

Remote controls for all necessary camera and lens adjustments are located on side of the blimp so that the operator can do all the things with the camera underwater that is possible when it is on the sound stage: i.e., change lens stop, change focus, adjust the CinemaScope lens, alter shutter opening, change motor speed and control lens on follow focus shots.

The blimp is equipped with a complete Aqualung unit—the same as worn by divers and operators using the camera when submerged—and this supplies the compressed air to the blimp chamber that provides air pressure for boyancy and protection of the blimp against the exernal water pressure. In addition to a pressure gauge there is an automatic pressure regulator which allows air to escape through a pop-off valve whenever the blimp moves upward toward the surface in water of diminisbing pressure, or it directs additional air into the blimp when it submerges Thus, pressure inside the blimp compensates for the change in water pressure externally at all times; it is done automatically without the need of attention of the cameraman or operator. Incidentally, there is no limitation in the depth which the blimped camera can operate In the Florida springs, MGM worked the cameras in depths exceeding 50 feet.

A feature which makes the blimp so easy to work with is that it is entirely self-contained. That is, there are no air lines or power cables attached to it and leading to the surface overhead. As already indicated, all necessary power for operating camera motor is supplied by a number of 45-volt Burgess B-batteries having a total output of 145 volts

The most interesting feature of the MGM blimp, however is the tubular, water-tight stabilizers mounted on top of the blimps. As may be seen from the accompanying photos, one blimp—that housing the heavier CinemaScope camera — has four stabilizing tubes, while the other has but two These are so mounted that they can be shifted forward or backward or sideways in order to position the camera at an angle or to level it when underwater.

Through the boyancy controls, it is possible to submerge the blimped camera to a depth, say for example, of 15

(Continued on Page 458)

STANDING ASIDE huge underwater camera blimps is John Arnold, ASC, head of the camera department at MGM Studio, who designed them and supervised their construction One of left is for CinemaScope, the other for wide-screen.

REAR VIEW of blimps is shown, below left. Here may be seen the small glassed portholes through which operators observe footage counter, shutter indicator and other controls. At right is view of the unique tubular stabilizers by which blimps are set on an angle underwater when required.

He Makes News Live

TV film reporter Bob Gray has worked out a way to give the viewer a seat at exciting news events.

By JIM F PALMER

Photos Courtesy of KPRC TV

DU PONT'S fast film lets him use natural light to give his news shots added impact, says TV newsreel photographer Bob Gray.

HAVE YOU EVER been fascinated by the plight of a perspiring, blinking city councilman on a TV film news show? It's probably not his constituents that upset him. It's that bustling TV cameraman with his battery of glaring lights and maze of wires.

Or take that gambling raid you expected to see on television. The only footage the TV newsman managed to bring back showed one last diceplayer being hustled into the police van By the time the cameraman could set up and plug in his lights, the raid was over

Most television news is brought to you via the motion picture camera, and until recently the need for extensive artificial light frequently made news shots stilted and unnatural Many were impossible, because the time required to set up bulky equipment allowed vital scenes to escape.

Now fast and complete news is being photographed daily by Bob Gray, chief film reporter for KPRC-TV in Houston, Texas. When news develops, Gray just aims his 16mm camera and shoots. Often he uses no artificial lights at all.

Gray's secret is a very fast motion picture film, Du Pont High Speed Rapid Reversal Pan (Type 931). It's so sensitive that almost any amount of light—from an open window or an ordinary light bulb—will do the trick The phtographer then overdevelopa the film to reinforce the image The result is casual, natural pbotograpby that makes for effective reporting.

More important, the new technique also lets KPRC-TV cover stories it was never allowed to touch before.

The Houston City Council, for instance, was leery when radio and TV newsmen first began taping and filming council sessions. The councilmen were afraid the meetings might take on a sideshow aspect. But when Gray began filming council sessions without elaborate preparation, using only existing window and overhead ceiling lights, the council soon accepted the camera as a reporting tool right along with a reporter's pencil. On occasions since, artificial light has been used in council sessions, but sparingly.

Until recently, TV film coverage of certain Houston courtrooms also was banned. Officials thought it marred the dignity of the court and disrupted the air of concentration necessary to legal proceedings. Now, working unobtrusively with existing light, Gray operates in the criminal courts of all three local district judges, with their blessing.

Gray hasn't abandoned artificial light entirely, of course His basic idea is to

(Continued on Page 462)

THREE CLIPS from typical candid newsreel films photographed by Bob Gray of KPRC-TV: 1) Gray used light from an unshaded window in this filmed interview with Bob Tucker, Democratic Party chairman, 2) Ordinary room lights allowed Gray to film school board hearing; 3) Existing light was used in covering this courtroom scene for TV.

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**Scene from "The Egyptian," 20th Century-Fox CinemaScope Epic.*

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*To film "The Egyptian," 20th Century-Fox chose the new B&L 40mm Baltar CinemaScope Lenses—cine and anamorphic lens elements in a unified mount operated by a single control.

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THE RATHER SIMPLE set on which the scene at left was photographed. Here may be seen how the various light units were placed to achieve the quality of final lighting we desired for Kodachrome.

FOR THE PUB scenes we used a lighting load of about 12-kw. which allowed us to work at around f/2.4. In order to simulate the essentially "warm" atmosphere of the English pub, we shot everything through a Wratten 81-B filter

Sync Sound Without Interlock

How one British producer of instructional films records sound on discs and integrates sound with the picture with the aid of a click-track.

By FRANK HARRIS, A.I.B.P., A.R.P.C., M.B.K.S.

THE INSTRUCTIONAL film has long since found an honored place in British industry and the list of commercial and other organizations using the medium is lengthening every year. There are many regular film producing companies who specialize in this type of film and even more privately-operated units who work exclusively to satisfy their own film requirements.

Naturally, the quality and scope of the end-product turned out by this latter class is found to vary considerably and ranges from the fine major productions of the famous Shell Petroleum Film Unit to the frankly unambitious record pictures made by the plant photographers of smaller concerns.

The privately-sponsored film may be purely instructional, designed to help the user of a given product to get the best from it. Or it may be straightforward publicity when it will probably contain a good deal of "human interest" or "entertainment value." The films for which the writer and his associates are largely responsible employ, as a rule, a combination of both techniques, for we believe that just as a good lecturer will lighten his teaching with the occasional touch of humor, so an effective instructional film is all the better if it can mix business with a little pleasure.

We are always careful never to let a gag obtrude and detract from the main purpose of the film. If it does not help the picture along, no matter how tempting we let it pass unused. For the foregoing and other reasons we work almost entirely in Kodachrome, and since our audiences include large numbers of apprentices and junior trainees—the buyers of the future!—our not-too-serious approach seems to work pretty successfully.

At this writing we are in the final stages of just such a film. Its subject—the sharpening of edge tools—is certainly of interest to nearly everybody at some time or other but, admittedly, it is hardly of spectacular appeal. And to be anything like complete in its teaching, the film has to cover a lot of

(Continued on Page 464)

HOMEMADE CAMERA BLIMP used with the Cine Kodak Special. It is made of wood and lined with thick felt, enabling camera to be used within four feet of the mike.

BIGGEST ECONOMY factor, perhaps, in shooting the Hank McCune Show lies in the photography. Producer Ted Allan uses an Auricon 16mm "Super 1200" camera, Commercial Kodachrome film and economical incandescent lighting. Here Allan and camera operator Bryden Baker line up camera for a "dream" scene for a recent film in the Hank McCune TV series.

Hank Mc Cune TV Series Filmed In 16mm Color

Ted Allan, veteran Hollywood phatagrapher, paints up trend to all-color far TV films.

By FREDERICK FOSTER

JUST ABOUT EVERY PRODUCER of television films is gearing for production in color and many have already photographed one or more shows using color film. A few have decided to go all out for color now and are so shooting their entire series. At present these films are televised in black-and-white, but they are planned for the time when color telecasting will become general.

The added cost entailed in 35mm color film production is a big factor retarding an immediate general-swing to color for TV films. Color film costs more than black-and-white; it costs more to light sets for color film; and, finally, color prints are more expensive than black-and-white. Where sponsors of TV film shows have been very reluctant to accept any kind of price increase for black-and-white films, it is obvious what their reaction might be to the much higher price tag that TV films in color will carry. So any production of TV films in color today, if it is to pay off, must be done at lowest possible cost.

One way in which this is being done is by shooting the shows on 16mm color film instead of 35mm. One producer who is doing this successfully is Ted Allan of Hollywood, who films the Hank McCune Show, a popular half-hour series starring McCune supported by well-known Hollywood film players.

The economy Allan effects by using the narrower color film is not all in the reduced film size, Allan is able to shoot 16mm Kodachrome a great deal more economically than 35mm color film for a number of reasons. For one thing, he

LIGHT, portable 16mm camera equipment makes it easy for the Ted Allan company to work fast on location. Here the company prepares to shoot a scene aboard a Navy destroyer on maneuvers off San Diego, Calif.—just one of the many locations used for action scenes for recent films in the Hank McCune series.

TED ALLAN, behind the Auricon "Super 1200" camera, directs the photography of the Hank McCune Show. At one time a cameraman for a west coast TV broadcasting company, Allan resigned to start his own TV film producing company.

can and does use more economical lighting than is required for 35mm.

The Hank McCune show sets are lit entirely with incandescent lamps—10-Ks for key lights, plus a number of spots and floor lamps for fill. But the big "Economy" factor, perhaps, lies in the photography. Allan, who personally directs the photography of the Hank McCune Show, uses an Auricon 16mm "Super 1200" camera. This marks the first time, perhaps, this camera has been selected for photographing a major TV film series in color.

Its many exclusive features contribute to the economies which Allan has found so advantageous in his TV film production operations.

"With its giant magazines providing a maximum film supply of 1200 feet of Kodachrome at one loading," says Allan, "the frequency of reloading is greatly reduced, thus saving time and operational expense. The camera produces a rock-steady picture. I like the three separate finder systems, which are combined in this self-blimped camera that runs so quietly no external blimp is required, even for sound stage operation. Its precision mechanism is another big reason I favor the "Super 1200." Recently we exposed in the camera a total of 45,000 feet of color film that came through without a single scratch. For this we credit the camera's unique sapphire film gate."

No less important is the light weight of the camera making for unusual portability; it is often used on a comparative-

(Continued on Page 163)

TYPICAL lighting of an "indoor exterior" for the Hank McCune Show. Allan Studio uses local power lines and incandescent lamps for all set-lighting. Pictured are Hank McCune (left) and Tammy Rettig rehearsing lines prior to a take.

High-Speed Filming Of Instrument Action

The technique and equipment used by National Bureau of Standards to investigate cutting action of dental burs.

By ALVIN D. ROE

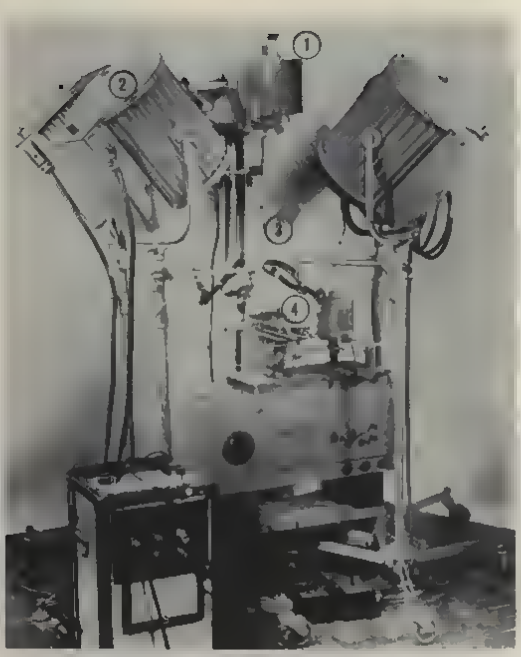

FIG. 1—EQUIPMENT used at the National Bureau of Standards for slow-motion photography of rotating dental burs (1) High-speed motion picture camera, (2) four 1000-watt spotlights with condensing lenses, (3) extension tube containing lenses for magnification, and (4) bur test machine. The camera control unit is at lower left.

SIGNIFICANT information on the cutting action of rotating dental instruments has been provided by a cinematographic technique recently developed at the National Bureau of Standards. In this technique, a high-speed motion picture camera is used in combination with an optical magnification system to make a greatly enlarged, slow-motion record of the action of each blade of a dental bur throughout the cutting cycle. It has thus been possible to obtain dynamic observations of clogging, intermittent cutting, eccentric rotation, and other hitherto unsuspected details of the passage of the bur blades through the tooth structure. Used in combination with conventional test procedures, the photographic method should prove of considerable value for experimental study of new types of dental burs since it will permit rapid evaluation of new designs prior to extended laboratory investigation.

The photographic method was devised and applied by Major Jack L. Hartley and Colonel Donald C. Hudson (both NBS guest workers from the U. S. Air Force Dental Service), and W. T. Sweeney and W. P. Richardson of the NBS staff. The project was part of a program of dental research which the Bureau is conducting in cooperation with the American Dental Association and the dental services of the Air Force, the Army, the Navy, and the Veterans' Administration.

Until now little has been known regarding the cutting action of dental burs in the cavity preparation of human teeth. Although considerable information is available on the cutting mechanism of industrial abrasive wheels and milling cutters, this information is not directly applicable to dental instruments because the properties of human tooth enamel and dentin differ so greatly from those of other materials and because dental instruments are so much smaller than the industrial cutters. Also, the patient's sensitivity to pain, frictional heat, and vibration is an important additional factor which must be taken into account in the design of dental burs. The high-speed photomicrography program was undertaken to provide basic information that might lead to improvement in the design and use of rotating dental cutting instruments.

In preliminary investigations a conventional laboratory camera was used with a 2-microsecond light source to produce still photomicrographs of dental burs cutting glass and resin specimens in a standard bur testing machine. While these still photographs were of some value, they did not permit sequential studies of the cutting action of any particular blade under dynamic conditions. It was therefore decided to make continuous observations using motion picture techniques.

Three 16mm high-speed motion picture cameras were used to study the cutting action of a large number of types of dental burs on mounted specimens of human dentin and enamel. The three cameras operated at speeds of 3,000, 7,000, and 14,000 frames per second; they thus effectively slowed the action of burs rotating at 2,500, 5,000 and 10,000 rpm, respectively, so that all phases of the rotation cycle could be readily studied. These speeds of rotation correspond approxi-

(Continued on Page 466)

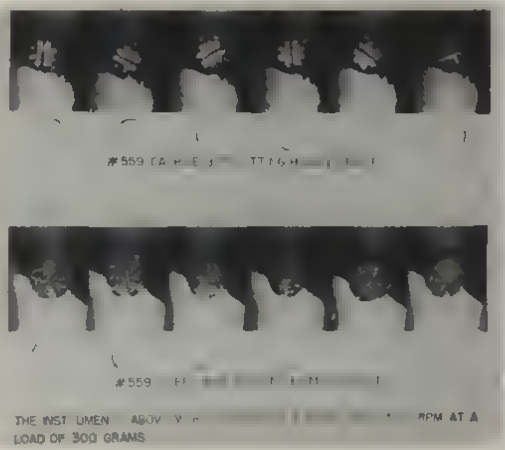

FIG 2—High-speed motion picture frames enlarged to show stages in the rotation cycle of typical dental burs.

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RADIO CONTROL unit for camera. Receiver with antenna is shown at lower left, battery box for camera motor power at right. Camera is started and stopped by transmitted radio impulse.

REMOTE CONTROL transmitter in hands of author. Pushing a button creates radio impulse which is picked up by receiver connected to camera control unit. Transmission range is 1 mile.

Radio Controlled Cinematography

Tiny radio transmitter used to control model planes may be used to operate 16mm cameras from remote locations.

By J. W. BAKKE

SMALL RADIO TRANSMITTERS, which model plane builders are using so successfully to control model aircraft in flight, now offer a practical means of remote wireless control of motion picture cameras used in specialized filming jobs.

The industrial and scientific cinematographer is often faced with the problem of photographing a non-repetitive event, such as that which may involve an element of personal danger, making it desirable to operate the camera by remote control from a safe distance. Other photographers are often faced with a similar problem when they wish to employ their artistic ability to the fullest and get an unusual high-angle shot from an overhead crane hook, from the front bumper of a moving automobile, or the wing of an airplane.

Such shots have always been possible, of course, using a lightweight electric motor-driven camera, a length of cable and a remote control switch. In most instances, this method has proven quite satisfactory; the objections are the need for stringing the cable and the possibility of electrical connections separating, or power failure. Also, where such wire-controlled shots are to be made from a great height, the control cable may be unhandy, hazardous or impossible to string. Here the radio control proves ideal.

The main control unit, which is essentially a small, compact radio transmitter on the order of the war-time "Walky-Talky," is relatively inexpensive and has but a single control switch. The receiving unit, which is used to stop and start the camera, consists of one or two small tubes and a relay in a tiny housing. Weighing but a few ounces, it can be mounted on the camera battery pack or on the camera itself. This miniature receiver can be operated if necessary from a line-of-sight distance of one mile. Pressing a button on the transmitter operates the receiver relay which controls the camera starting switch.

In specialized filming operations, where more than one camera may be required to record an operation from

TRANSMITTER, which operates on frequency of 27 255 mgc, relays radio signal to remote receiver which actuates camera mechanism.

various distances or angles, the one transmitter can be used to control all cameras, as long as their operation (starting and stopping) is uniform.

As with all radio transmitting equipment, a simple permit for operation is required by the Federal Communications Commission. However, no technical knowledge of radio is necessary nor is an examination required. Anyone can use the equipment; complete instructions for its operation are furnished at the time of purchase.

Originally designed for use with model planes and target drone planes used in anti-aircraft gunnery, the equipment is quite rugged and capable of withstanding heavy shocks. Simplicity of operation, low cost and lightweight make these units worthy of consideration for operating 16mm cameras in the recording of many subjects and technical and mechanical operations that heretofore have presented unsurmountable photographic problems.

Radio control is most effective when used with electric motor-driven cameras. Battery-operated motors are now available for just about every 16mm camera on the market. The author used a con-

(Continued on Page 462)

High-Speed Film Processor

The Bridgamatic processor may be operated in daylight and is entirely automatic.

One of the popular film processors designed specifically for high-speed processing is the Bridgamatic, distributed by S.O.S. Cinema Supply Corporation, New York City. Several models are available, each designed for a specific need. One model, which was designed especially for processing films having pre-hardened emulsions, such as DuPont's 930A and 931A, utilizes but 100 feet of leader, thus cutting 2/3 of the time-lag due to leader travel. In the Bridgamatic Model RT-R (designed for film patrol systems), 16mm reversal film is in the first developer but 12 seconds and dries in less than 30 seconds.

Filmline Corporation, builders of the Bridgamatic, put to good use the experience gained from the development of the Model RT-R processor. With only slight modifications the company produced Model R-TV for the specific needs of television stations producing their own motion picture films. Available as a standard daylight operating model, the R-TV is capable of producing a positive reversal film ready for telecasting in about three minutes.

The operational routine for this model is as follows: Using DuPont 16mm reversal film No. 931A, first developer time is 36 seconds; shortstop bath 6.4 seconds; bleach 20 seconds; clearing bath 20 seconds; second developer 20 seconds; hypo 6.4 seconds; spray wash 12 seconds; dryhox 39 seconds. The total elapsed time is a trifle over 2½ minutes. Other reversal films, and negative and positive films may also be processed with this same machine with comparable savings in time.

Utilizing all the advantages that the high-energy processing solutions afford has been a big factor in the success of both Bridgamatic models. The Model RT-R machine operates at about 100° F. with the film traveling at speeds up to 85 feet per minute. The Model R-TV operates at 90° with the film traveling 35 feet per minute and more.

Both models are water-jacketed

(Continued on Page 466)

ONE OF THE AUTOMATIC developing machines designed especially for fast processing of 16mm film is the ultra-high-speed Bridgamatic, above, originally created for race tracks. It is now used by many TV stations. Thanks to the new, fast negative emulsions now available, the Bridgamatic, using high-energy solutions, can process a hundred feet of film and have it ready for projection within three minutes.

OFF-CENTER framing can result from a bent pull-down claw. So when cleaning the camera film gate, use care and avoid bending any delicate parts.

Is Your 16-millimeter Camera Showing Its Age

Some simple tests you can make to check accuracy and performance of your camera.

By HANK STOCKERT

Illustrations by the Author

THE PHOTOGRAPHIC QUALITY obtained with a motion picture camera can only be as good as the camera itself. If the mechanism is worn out or out of adjustment, the results will show prominently on the screen. Although many of the components of a motion picture camera are similar to the related components of a still camera, which may be easily tested and adjusted following well-established procedures, the procedures for correcting faults in motion picture camera mechanisms are not as generally understood.

A movie camera has many parts which move during its operation, and some of these move extremely rapid. Eventual wear must be expected. The important point is to know how to test your camera so that it may be given due attention before wear increases to the point where it causes additional damage to the parts, or even ruins film. The frequency of such testing should depend upon the use the camera is given. A cine camera allowed long rests, for example, with its drive spring untensioned and well protected from dust will need less checking than a similar camera which does daily professional duty.

The amount of "play" tolerated in a camera is dependent not only upon the standards set by the owner but also by the service to which the camera is put. A camera used for television newsreel work may have more unsteadiness in the film movement than a camera used upon a title stand. Any scene shot with a firmly anchored camera, including motionless objects crossing the frame line, will show the effects of picture unsteadiness more readily than a scene not meeting either or both of these conditions.

Your projector must be eliminated as the source of unsteadiness before you can correctly blame this trouble on the camera. Although a rough indication of projector condition can be obtained by projecting a relatively new print known to be steady, there is a better test. The best method for checking 16mm projector unsteadiness is to use the special test film prepared for the purpose by the Society of Motion Picture and Television Engineers. This film, Code Number ST16, has holes punched in the picture area at the same time that the sprocket holes were punched. By following the SMPTE's directions this film may be used to obtain a quantitative measure of projector unsteadiness.

The camera test for unsteadiness may be so planned that you may also check several other details without influencing the results of the steadiness check. For example, if an accurate record is made of the framing of the test subject in the viewfinder, the accuracy of the viewfinder frame may also be established. Some manufacturers design their viewfinders to cover a slightly smaller field than that of the lens, as a preventive measure against parallax errors, should the cameraman forget to make proper allowances. Where the camera operator is not aware of this it can result in scenes ruined from shooting beyond the edge of sets or by including lights which have been located close to the set line. Reflex-type viewfinders should also be checked at this time if the camera is so equipped.

The actual subject matter for the camera test is limited only by the imagination of the photographer. In shooting out-of doors, you can find no better test subject than the time-honored brick wall. This will also allow you to judge lens sharpness by examination of the rendering of the minute texture of the bricks and mortar. Make sure that the camera is mounted upon a rock steady support. By photographing the wall head-on, you will avoid perspective troubles when evaluating viewfinder accuracy in the screened result.

For testing your camera indoors you can prepare a chart similar to the one

illustrated below. This chart offers an advantage over most outdoor testing targets since a special technique will make the steadiness test completely independent of any other influencing factors such as film shrinkage, perforation inaccuracy, projector unsteadiness, etc.

All of the precautions mentioned in the outdoor test should be observed indoors. A firm table for mounting your your camera is better than a questionable tripod, unless the special technique is utilized. The test chart, with the "X"s crossing the frame line will accurately locate your original framing during projection. Since you will probably be working close to the chart, viewfinder parallax will be so great that the framing can only be checked upon cameras which allow viewing the image through the lens, or with cameras that can be used with a rackover device that places the viewfinder in the same position that the lens will occupy during the filming.

Where you can backwind the film in your camera between takes, or can rewind the take in a darkroom, you may use a method which will eliminate all causes of unsteadiness other than the camera. This technique calls for shooting from five to ten feet of film of a test chart similar to the one illustrated. After the first take has been backwound to the beginning, shift the camera by a very small amount, both horizontally and vertically. If you reduce the exposure of the second take by about one stop, evaluation of screened image will be greatly simplified. After this double-exposed footage is processed, make a loop of the film and project it. *Any inter-movement of the pairs of lines from the two takes will be due to camera unsteadiness alone.*

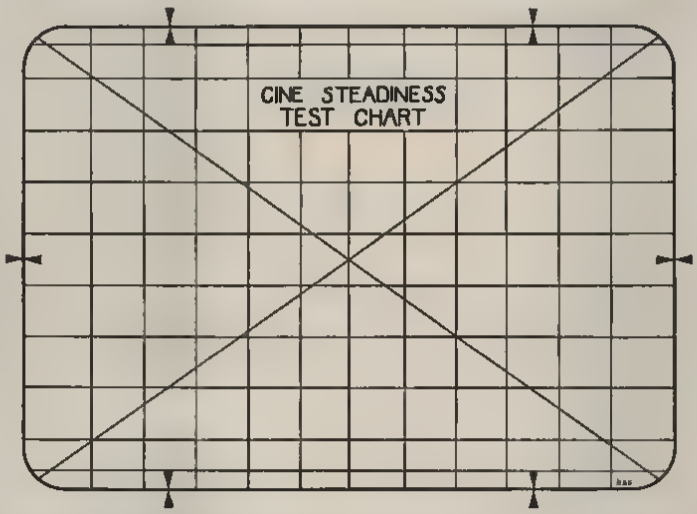
In screening the test film and evaluating any errors, it isn't the average difference in the location of the lines you will be interested in, for this difference will represent the shifting of the camera between takes. The movement *relative* to each other will represent *double* the amount of camera unsteadiness. Examination of the film may give a clue as to whether the trouble, if any, is due to edge guide (horizontal image movement) or pull-down trouble (vertical image movement). Although this isn't sufficient information to enable you to pinpoint the cause, you can aid the factory to whom you send the camera for adjustment by sending along the test films for their inspection and study.

Many 16mm films have been ruined for audience enjoyment because of another possible camera defect. Even among professionally-produced films this defect may be detected all too often. I refer to those films that must be re-framed frequently as they are screened. In most instances, this fault lies with the use of two different 16mm cameras in the photography which were not first checked to insure that aperture plates of both were properly aligned.

Sometimes this defect is caused more through careless camera handling than by camera wear. It sometimes can be blamed upon a pull-down claw which has been bent during film loading, or during an extremely bad film jam. Since the error is liable to be in the range of ten-thousands of an inch, it doesn't take much to bend the claw sufficiently to change the frame line location. It is evident that remedy of such a

(Continued on Page 456)

STEADINESS of intermittent movement and viewfinder accuracy may be checked at the same time, by photographing a chart such as shown here. The procedure is described by author in the text.



TEST CHART for checking intermittent steadiness and viewfinder accuracy. Photograph and enlarge this drawing to approximately 14-inches in width or have a photostat made, then photograph it with your 16mm camera as outlined by author.

DOLLY SHOTS can enhance family movies—give them a professional touch. Here a tripod-mounted camera rides a simple dolly that is equally-adaptable to professional filming.

TRACKS for the dolly wheels make for smoother dolly travel. Here a commercial-type dolly designed for both amateur and professional cameras, rides a channel track made of light-weight metal that is generally available in heavy hardware stores.

You Can Make Dolly Shots, Too

Whether you buy a camera dolly or build one, or use the baby's tay wagan, yau'll find dolly shats add a lot of class to your movies.

By JOHN FORBES

IF A DOLLY SHOT can enhance the story-telling of a feature film, it can contribute similarly to an amateur film, as has been proved so often in well photographed 8mm and 16mm movies. It is surprising, therefore, that so few cine photographers use the device; for effective dolly shots can be made with the aid of a great many mobile supports other than specially constructed camera dollies.

By employing a dolly in shooting certain action, you not only give your film an added professional embellishment, but, when properly used, the dolly shot can enhance the flow of a film story, and even improve the pictorial effect of an unpretentious family record film.

For filming indoors, a dolly like the one pictured above, is available from better-stocked camera stores at fairly reasonable cost. But for those who delight in building their own photographic equipment, a dolly capable of producing comparable results can be built in the home workshop, using scrap lumber and three furniture casters or roller skate wheels. Of course, for a more professional job, one can purchase rubber-tired wheels—even balloon-tired wheels—from hardware stores that will provide smoother travel of the dolly when used outdoors as well as indoors.

The first step is to make a T-shaped frame work of pieces of wood 2″x2″ by 30″ in length. At either end of the member representing the top of the "T" a fixed or non-swiveling wheel is attached —both fixed to travel parallel in the same direction. At the end of the other member a swiveling caster is mounted. This permits steering the dolly by the camera operator. The "free-wheeling" of the caster will provide all the free movement of the dolly necessary.

Certain filming situations preclude the use of a camera dolly unless a track is provided for it to run upon. Such a track may be constructed from two-by-fours of the required length and laid flat. A trough for the wheels to follow may be

(Continued from Page 460)

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CAMERA SHOWING AGE?

(Continued from Page 453)

minute but important error should be placed in the hands of the manufacturer rather than to attempt any amateur cures. Often, efforts by inexperienced camera mechanics to adjust or repair such cameras results in more trouble such as side-effects, overcorrections, binding of the associated pivot points, sidewise maladjustment, punching of the film, etc

A suitable test for proper framing is one of the simpler tests the average cine camera owner can perform himself. You don't even have to shoot special footage. All that is necessary is a decent length of original camera film. (Prints, which may exhibit faults of the printer, should not be used.) Original negative is as suitable as reversal original. One important requirement is that the film be perforated on both edges. If your's is a single-system sound camera, you have, the choice betwen shooting a length of double perforated film (if your camera will accept it), or shooting a second piece of single perforated film of clear or blue base stock, through the back. The resulting out-of-focus image will not matter. Blue Base film will require additional exposure, common positive print stock may also be used and will serve perfectly.

To make the test for improper camera frame line location, make a test loop by splicing two sections of the camera original together so that one is backwards. Thread up this loop and project it. Shift the projector framing lever so that either the top or bottom frame line is visible. Going to the screen, place a piece of dark tape on the screen at the location of the frame line for one of the film sections. The shift from this location for the frame line of the other film section represents double the frame line error.

You may carry this test one step further by computing the magnification ratio of your projection setup. Measure the amount of frame line shift and divide this by the magnification to determine how large the camera error is.

One note of caution regarding frame line troubles: Some cameras give different framing at ultra-fast or ultra slow filming speeds. If you use more than one speed, check the framing in similar manner for orignal films shot at the limits of your shooting range.

There is one more trouble item which may creep into your footage. This is the possibility of uneven density from frame to frame, due to an erratic shutter or some other moving part of the camera. Where the camera is electric

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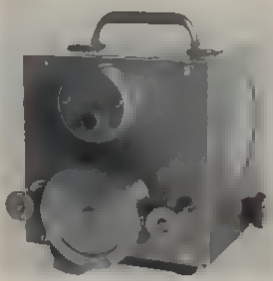

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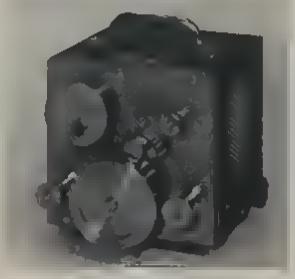

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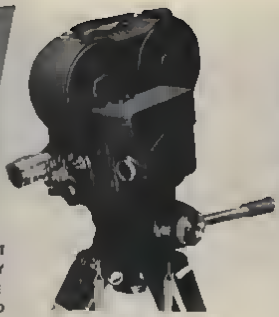

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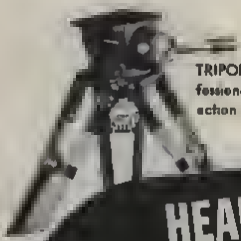

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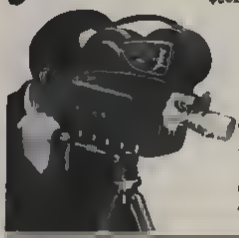

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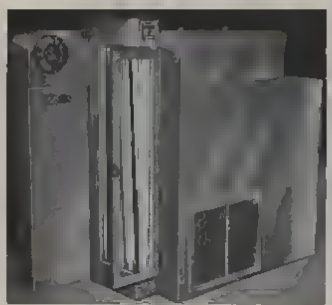

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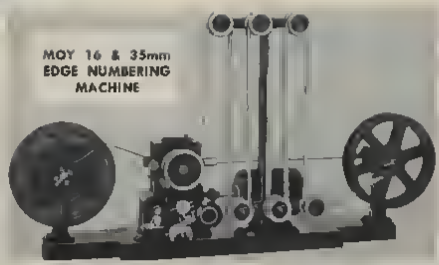

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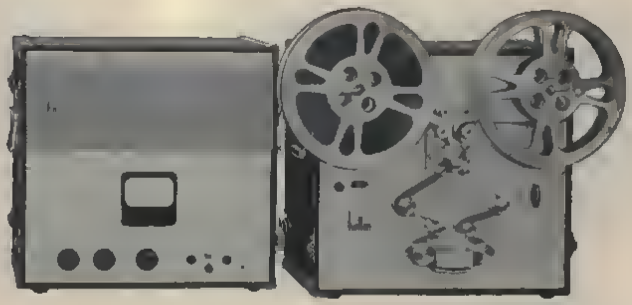

The recorder shown is 35mm using two flywheels, designed to facilitate conversion to multiple track, stereophonic, cinemascope etc
The two case portable Model 235 magnetic film recording system is also available in both 35mm and 16mm single drum system. Literature available

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motor driven the trouble might be due to a defect common with some synchronous motors called "hunting." If you suspect your camera is giving flicker trouble, shoot a test strip of some neutral gray object full frame, a gray wall, cardboard, etc., or underexpose a section of clear northern sky. Projection of this test strip may not tell you much, but measuring the density of the varying frames of the test strip should give the answer. END

UNDERWATER BLIMP

(Continued from Page 441)

feet and keep it at that level indefinitely. Now if the shot calls for the camera to shoot down from this height at an angle, the stabilizing tubes are shifted toward the back the distance required to lift back of the camera above the level of the front. For an up-angle shot, the tubes are pushed forward and locked in place. With other underwater cameras, it has been necessary to mount them on a tripod or parallel to make shots of this type, with consequent added loss of production time required to erect the camera support, and to move and set the camera upon it. Lateral shifting of the tubes is employed to level the camera from left to right.

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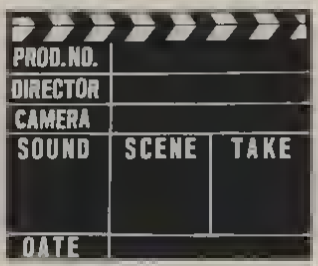

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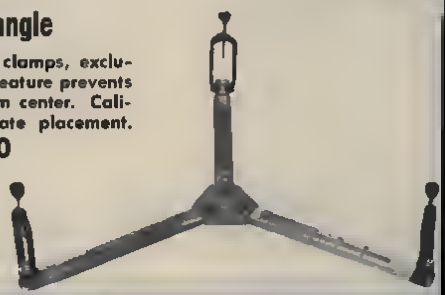

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the few instances when it became necessary to tie down the blimped cameras with cables leading to anchors on floor of the springs. This was because there were underwater currents which would manifest themselves so suddenly the operators could not hold the cameras rigid against them. "Otherwise, the cameras were as easy to manage or maneuver as a feather," said operator Dale Deverman

When making purely static shots, the cameramen would deliberately move the cameras ever so slightly in order to enhance the realism of having actually photographed the scenes underwater.

It is to the great credit of John Arnold, his engineers and to the cameramen who photographed "Jupiter's Darling" that not a single camera failure was experienced during the entire period of location filming in Florida. The two blimps, imposing in their stature and looking not unlike some strange new lethal weapon of war, rest for the moment in a corner of the camera department at MGM studios But each day, as more and more of the spectacular color footage they made possible is viewed in the projection room by studio executives, the enthusiasm engendered brings nearer a new production which will again see these monsters of the deep in action.

DOLLY SHOTS

(Continued from Page 454)

formed by nailing strips of wood 1-inch square on the two-by-fours.

In use, care should be taken to insure that the tracks lie solidly on the ground, and level—except where the dolly travel is purposely planned on an incline or otherwise. Where wooden tracks of any great length are laid over uneven ground, wooden wedges should be inserted beneath the tracks in the low spots to support them as the dolly passes over

Follow shots with a dolly-mounted camera can be made in a number of ways—that is, the camera can follow the players or the action from the side or rear, or the camera may precede the players who follow some distance behind the retreating camera The method selected, of course, will depend upon the situation, the location and the terrain on which the action takes place

Let us take, for example, a familiar bit of action often recorded by home movie cameras—that of a child riding a tricycle Where such action is filmed on a sidewalk in front of the home, the camera and dolly follow the child from any of the angles previously mentioned, and —if the sidewalk is smooth—without the need for a track.

On the other hand, suppose the subject for filming is a hiker on a country lane, or two people walking along a path in a thicket. This might involve shooting from a track laid parallel to the action, which would permit the camera to move along smoothly during the entire length of the shot.

Dolly shots reach their height of effectiveness when made out of doors of action such as this, where objects such as trees or shrubbery momentarily come between camera and players during progress of the shot. It is the type of dolly shot familiar in professional motion pictures, yet one which many cine photographers have yet to try.

Quick dolly action, forward or backward, is particularly adaptable to fast movement of subject when a "zooming" of the camera toward or away from the subject will effectively heighten interest. This effect can be utilized for ordinary home movie subjects, too

A problem that arises when making dolly shots is that of keeping subject in sharp focus throughout the cycle of camera travel, especially where subject moves progressively toward or away from the camera, or where the dolly-mounted camera moves toward or away from a stationary subject. The best answer to the problem is to provide sufficient light in the scene to enable stopping down the lens to gain maximum depth of field

As an example, suppose a certain bit of action calls for the camera to start filming at a distance of ten feet, then move progressively forward to a distance of 3½ feet. Here we have a problem of keeping subject in sharp focus during the entire time camera is traveling from the ten-foot mark.

If there is insufficient light and the lens has to be opened to f/1 5. depth of field will be very limited The only way the shot can be made so that subject will be in focus at all times is to gradually change focus of the lens as the camera moves toward subject—obviously a chore requiring a capable camera assistant.

On the other hand, if light is sufficient to permit shooting the same action at f/8, depth of field will be considerably greater. By setting focus at ten feet at the beginning of the shot, it can be left at that mark for the entire shot, because of the increased depth of field created by the smaller lens stop

Here a depth of field chart is a handy thing to have for reference. Several are to be found in the American Cinematographer Hand Book, published by Jackson J. Rose A S C Lacking these, it is well to remember that depth of field is increased as the size of the lens stop is reduced.

For those who are not prepared to buy a small light-weight dolly or to build one along the lines suggested earlier,

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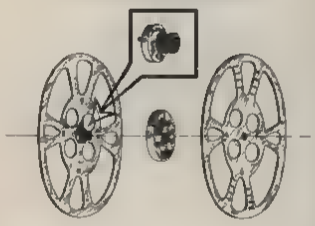

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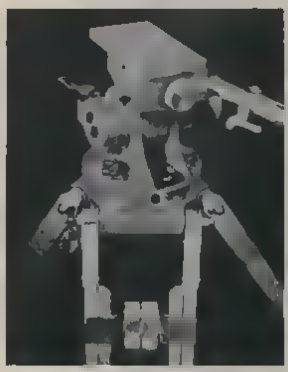

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dolly shots can be made simply and easily by employing any one of a number of vehicles such as a child's express wagon, a tricycle, or other four-wheeled toy. Some very successful dolly shots have been made by movie amateurs who mounted the camera on a carpet sweeper for a low-angle travel shot. Still other methods include holding the camera while sitting astride the hood of the family car, as it is driven in the desired direction, or setting up the camera in a rowboat for a smooth shot on water.

Remember, just about everything mechanical and solid that moves may be used for a moving camera shot in some way. So if you want to try a shot or two just to see what a difference moving camera shots make on the screen, follow one of these suggestions. Later, you are sure to buy or build a dolly. Your local camera store can probably supply one to suit your needs, or get it for you.

MAKES NEWS LIVE

(Continued from Page 442)

use natural lighting whenever it helps him get action he couldn't capture otherwise. Often he's willing to sacrifice detail for the over-all impression.

"It's the news we're after," he says. "In this business, that comes ahead of technical perfection."

Gray cites the coverage of a beauty contest as an example. All eyes are on the winner as she walks across the platform to receive the prize. All eyes except the photographer's. He sees the adoration on the face of a young girl spectator as she gazes up at the new queen. He swings his camera around almost automatically, switches focus in an instant, and captures the kind of human interest shot that can't be posed. He does, that is, if his camera is loaded with

New Accessories For Film Printers

SPECIAL EQUIPMENT designed to increase production and improve the quality of prints, particularly in color productions, for users of Bell & Howell motion picture printers is now being marketed by the Motion Picture Printing Equipment Company, Skokie, Ill.

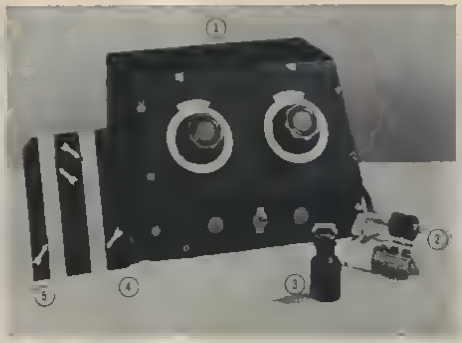
The company offers a Sound Printing Head which, when added to Models J and D Bell & Howell contact printers, permits printing both picture and sound track simultaneously in one operation, using separate picture and sound negative. Quality prints are insured by printing the sound track on a precision sound drum.

The Peterson Automatic Fade attachment is another accessory which the company offers for use on the B & H Model J printer. It is easily installed. Fades are made by a shutter mechanism which permits increasing or decreasing light at a uniform rate. Fade length can be varied from 20 to 180 frames.

A third accessory offered by the company eliminates the need to edgenotch film for changing the printer light control. New device provides electronic control of the printer light and is actuated by magnetic cueing spots applied to edge of film. The unit has two independent channels that permit dual control of printer light and filters by placing cue marks on both sides of film. An actuating head (2 in photo below) having proper rollers has been designed especially for Bell & Howell printers.

The company has also developed an Automatic Light Control Shutter for installation in a Bell & Howell printer, which permits changing the light intensity by a shutter instead of through altering the electrical resistance.

Descriptive literature on all of the above named accessories may be had by writing the company at 8136 North Lawndale Avenue, Skokie, Illinois.



FILM PRINTING equipment accesseries developed and manufactured by Motion Picture Printing Equipment Co. 1) Electronic independent 2-channel relay, 2) Actuating head for B&H printer where electronic cueing of light changes replaces old notching method. 3) Iron oxide paint used to spot films scenes to effect electronic cueing. 4) Arrows point to cueing spots applied to edge of film for printer light cues; 5) Arrows point to old method of notching film for activating printer light changes.

a film that can penetrate the shadows.

For inside work, Gray prefers day light from a window. He uses Type 931 film with a large stop opening, careful focusing and controlled long development. In the absence of a window, fluorescent lighting is the next best source. On occasion, ordinary light bulbs must be used.

The Texas photographer has obtained excellent closeups with a 75-watt bulb as much as five feet away from the subject. He has taken what he considers acceptable shots with only a 60-watt bulb six feet overhead. And he takes long shots as well as close-ups in a crowded courtroom where there are only a dozen 100-watt bulbs 12 feet overhead.

Even with overdevelopment, however, Gray finds some existing light scenes that come up without enough contrast. But if there's a sharp enough image—and the film is newsworthy enough to be used—television engineers can adjust electronic contrast controls to make the picture appear more contrasty on home TV receivers.

The natural lighting technique is not new. It has been used in still photography from the earliest days. But time exposures made it possible. Now, thanks to the speed of films like Du Pont Type 931, the technique can also be applied to motion pictures.

Through proper use of fast film and a willingness to tread fresh paths in news photography, Bob Gray and KPRC-TV are doing their part to create a better informed community.

Reprinted from Du Pont Magazine, August-September, 1954

HANK McCUNE TV SERIES

(Continued from Page 447)

ly light tripod instead of a dolly or other type of mobile support commonly used on the sound stage. Quick shifts of camera and tripod to a new setup are thus effected without the need for more than one camera crewman. With the production company thus streamlined, it can wrap up a single show in 3 days, or two in a week.

Power for set illumination for color productions is always a big cost factor. But by using incandescent lamps exclusively, Allan is able to use current supplied by the local power and light company, thus dispensing with the need for a generator and a crew to operate it.

Where a strong light is required to produce sharply-defined shadows, as for a venetian-blind effect on walls, etc., Allan simply removes the Fresnel lens from a 10-K lamp and directs the strong light beam on the blind or wall. Or-

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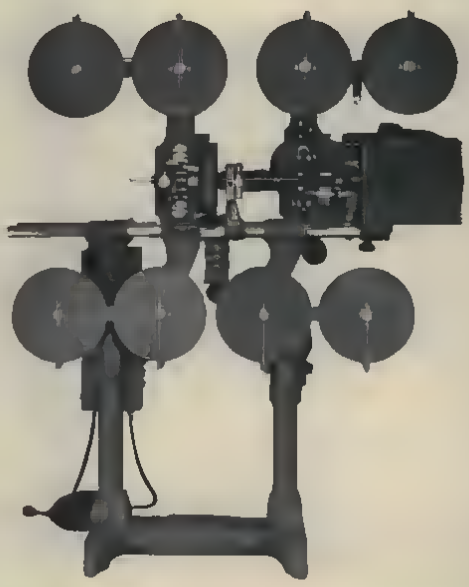

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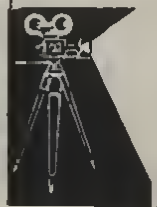

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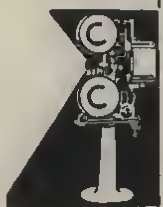

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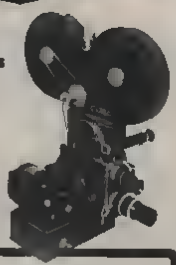

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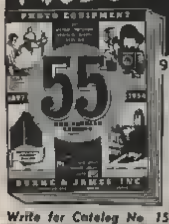

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dinarily, a powerful arc lamp would be used for this purpose.

A compromise is made between low and high key lighting in order to complement both the color film and the television black-and-white reproducing system, by employing 10,000-watt key lights and 5,000-watt skypans, plus snoots and diffusion for fill lights. Seniors are used for back light and "kickers" are employed in order to keep the illumination at a uniform level at all times, permitting use of the same lens stop for all shots.

Unlike so many TV film producers who confine shooting to the sound stage for economy reasons, the Hank McCune troupe shoots a great many scenes out of doors in natural locations. Here the portability of the Auricon camera and the ability to dispense with booster lights in favor of reflectors make exterior filming as economical as that indoors at the studio. To shoot shipboard scenes for a recent film, the Ted Allan company recently went aboard a Navy destroyer on maneuvers off the coast of San Diego. The small technical crew required along with the compactness of the camera and grip equipment made this assignment an easy one.

In addition to the Hank McCune series, the Ted Allan Studio has several other television productions, including two unique puppet shows, slated for filming in 16mm color. Included in this schedule also is a dramatic series to be produced at the rate of six 15-minute shows a day.

The use of the Auricon 16mm "Super 1200" camera for filming the Hank McCune TV films in color, highlights the strong trend toward all-color 16mm film production for the fast-growing demands of the television industry.

SYNC SOUND

(Continued from Page 445)

ground. Its message is directed at what over here we call "the man in the street," and our problem is to keep the thing interesting and alive throughout its forty minutes' running time.

We felt that our story had to be carried by five or six stock characters—typical workmen who could be taken as representative of the principal trades using our product. In addition to putting over convincingly the instruction peculiar to his own trade, each character had also to be dramatically interesting. For continuity's sake there had to be a reasonable link between the workmen and this was achieved by bringing them together in that typically British rendezvous, the "local," or as it was better known to many thousands of our G.I. friends, the "pub." As they begin to

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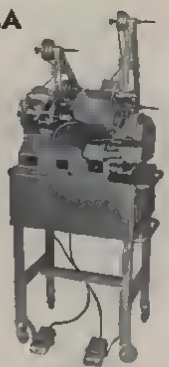

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talk of their own particular interest in the art of sharpening we dissolve to the workshop or the farm and illustrate the dialogue with instructional scenes. After each instructional sequence we cut back, of course, to the pub for a little light relief—by no means a new device but still a good one for preventing pictures like this from becoming static.

The building of the pub set was no embarrassment to us for we have an excellent studio with adequate lighting gear and most of the equipment necessary to the kind of film we normally produce. But we could hardly justify the heavy capital expenditure for synchronous recording apparatus, which would only be used once in a blue moon, anyway. For the instructional sequences there was no recording problem since these required nothing more than the addition of the usual "wild" commentary. The pub was a different matter for there we had to have live dialogue, a new experience for our small unit. We owned, however, a first-rate disc recorder capable of really good sound quality and this was pressed into service. In trying to run the discs in sync with our Cine Kodak Special cameras we encountered all the anticipated difficulties—and several new ones! But as so often is the case we finally found that the simplest method was the best.

Believe it or not, we dispensed with all forms of interlock and operated disc recorder and spring-driven camera independently of each other. Here is what actually happens on the set: With the scene rehearsed and everyone ready for a take the sound man starts his recorder and when satisfied that he is cutting properly, calls, "Sound OK!" This is the cue for the camera to start and for the clapper-boy to announce and mark the scene. Action then begins and at the end of each take the clapper-boy again steps in to mark its conclusion.

Once a sequence is shot and recorded the discs are sent away for dubbing on to film and here, of course, is the problem of tight synchronization. Our own solution involves the careful use of a "click-track" which is made immediately before shooting begins. We take a roll of spoiled but unprocessed film and mark every twenty-fourth frame with an easily-seen cross, then load it into the camera. The camera itself is set to run as close as possible at twenty-four frames per second although, in fact, this need not be anything like accurate. Constant speed is the important thing here and in this respect we find the Special is excellent.

With the lens removed and the recording microphone placed close at hand we start camera and recorder, closely watching the gate. As each cross flashes into view, we tap out a sharp signal—

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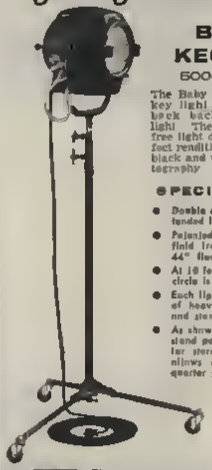

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- As shown below, structure of stand permits folding of legs for storage. Angular design allows clearance for close quarter grouping

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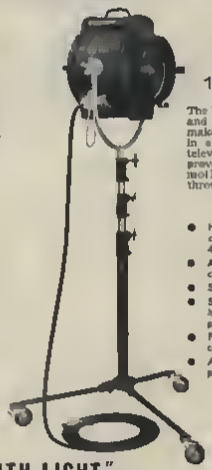

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using, in our own case, a metal pencil tapped on a slate—which is picked up and recorded on disc. It follows that so long as the resulting disc is played back on a turntable running at the same speed as the recorder, we shall have an audible and reasonably accurate record of the camera speed. This "click-track" can also be readily matched to the speed of the sound-camera used for dubbing. A little thought will show that it is not even important that the picture-camera and sound-camera are running at the same speed nor that the recording table and the dubbing-playback-table should do so. So long as the click-track is brought into line with the sound camera, all recordings made at the original speed (of the click track) will be in reasonably close sync with the picture.

In practice, we found the maximum error between picture and sound-track was about eight frames in a twenty-foot shot. Our method of correcting this is to locate and mark four fairly equally-spaced silent points on the track and at each point to cut out two frames or add two frames of buzz-track, according to whether the track is longer or shorter than the picture film. Obviously, there are serious disadvantages in the method and that even lacking regular equipment vast improvements could be made using synchronous motors and/or the more modern and flexible tape. But that was a case where the normal run of our present work would not justify the installation of costly recording equipment and we were anxious to make the best of what we had.

As a matter of fact, the only additional piece of apparatus we couldn't do without was a blimp for the Special, and as there was great difficulty in importing one, we made our own. On the credit side we managed to get excellent sound quality. Lip-synchronization is close enough — certainly closer than could have been expected from the players post-synchronizing the lines against their own lip movements on the screen.

I mentioned that practically all our work is on Kodachrome For the pub scenes we used a lighting load of about 12-kw., which allowed us to work around f2.4. In order to simulate the essentially "warm" atmosphere of the English pub, we shot everything through a Wratten 81B filter which, without increasing exposure, effectively lowered the color-temperature of the lighting to give us what we needed.

Naturally, we had our difficulties The cast of six, headed by a well-known British screen actor, were only jointly available over one particular week-end, which meant shooting 120 scenes including closeups and cover shots (about thirteen minutes' screen time) in something like twenty-two working hours. We can think of quicter ways of spending a week end but — so what? There's still a lot of fun to be had making pictures. Especially when your sound equipment can't possibly work — and does!

HIGH-SPEED PROCESSOR

(Continued from Page 451)

throughout and all solutions are automatically temperature-controlled.

The dry-box, of unusual design, holds only 33 feet of film, which is rapidly dried after leaving the final wash, in a turbulence of air heated to a temperature of 140° F. The unique design of this segment of the processor imparts a swirling motion of air at the point of entry in the drying compartment and all moisture-laden air is forced out.

Model R-TV has seven tanks; a 1200-foot film magazine which takes loading spools of the film 50, 100, 200, 400 or 1200 feet in length, just as they come from the camera; a re-circulating pump for the first developer; and agitation for bleach, clearing bath, and second developer. A quiet, rotary-type air compressor supplies filtered air for the squeegee and solution agitation. Daylight operation is entirely automatic and requires only limited supervisory attention by one employee.

HIGH-SPEED FILMING

(Continued from Page 448)

mately to low, average, and high dental operating speeds One-hundred-foot rolls of 16mm black-and-white reversal film traveled through the camera in from 0.8 to 1.25 seconds. About one-third of this period was utilized by the camera in building up to top speed. The action recorded on the film was extended for study to approximately three minutes by projection at 24 frames per second.

Adequate magnification was obtained by attaching to the camera an 8 inch extension tube containing an f/4.0 6-inch telephoto lens and a 2-diopter supplementary lens. The extension tube reduced the indicated f/ stop of the lens to an effective aperture of f/9.2. A high-intensity light source of eleven 750-watt pre-focused floodlamps was required for the 3,000-fps camera because of this small aperture and an exposure time of 1/15,000th second per frame. Additional illumination was needed for the faster cameras, since the exposure was only 1/35,000 second for the 7,000-fps camera and 1/70,000 second for the 14 000-fps camera. This illumination was provided by four 1000-watt photo spotlights with parabolic reflectors Their light was further concentrated by means of 2-diopter condensing lenses four inches in dia-

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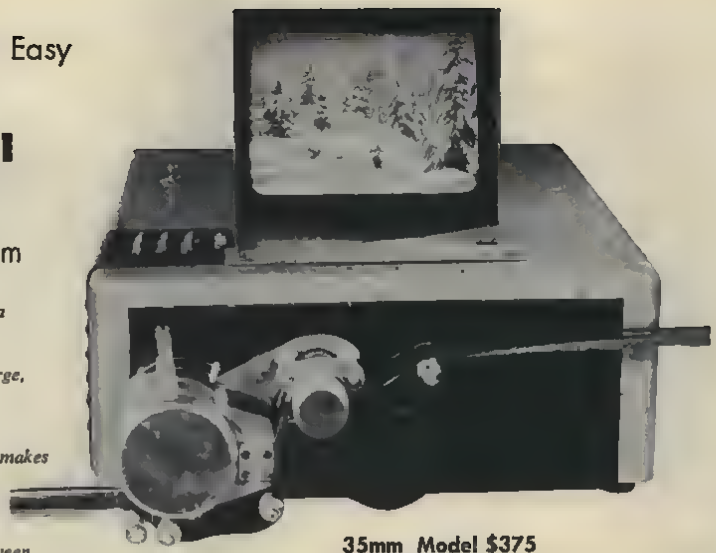

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meter. Thus, over 300,000 foot candles of light was focused on an area of two square inches. The short interval of time involved in turning on the lights, energizing the camera, and turning off the lights prevented any damage to the specimen or equipment from heat.

Much can be learned regarding the operation of the bur blades through observation of the slow-motion films projected on a screen. For more detailed study of individual frames, enlargements are made either from the 16mm film on direct-positive paper or from negative film, which is used in the cameras when print studies are desired.

The photographic evidence shows that, with very few exceptions, all burs studied were intermittent cutters because of eccentricity and irregularities in blade formation. Chip formation is revealed in detail as the individual bur blades pass through the excavation in the tooth material. A chip that is formed by one type of blade may break away from the parent substance and strike the blade ahead, thus causing clogging. Fine, pulverized chips, produced by a bur which is cutting ineffectively or which is rotating at too low a speed, are seen to follow the vortex of air created by the revolving bur until they are carried back into the excavation. However, the slow-motion

(Continued on Page 469)

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ALLIED ARTISTS

SAM LEAVITT, "Annapolis Story," Technicolor.

WILLIAM SICKNER, "Ketchikan"

ELLSWORTH FREDERICKS, "Shotgun."

COLUMBIA

LESTER WHITE, "Women's Prison"

METRO-GOLDWYN-MAYER

ARTHUR E. ARLING, "The Glass Slipper," Eastman color, wide-screen.

WILLIAM MELLOR, "Bad Day at Black Rock," Technicolor, wide-screen

PAUL VOGEL, "Jupiter's Darling," Eastman color, CinemaScope.

JOSEPH RUTTENBERG, "The Prodigal," Eastman color, CinemaScope.

ROBERT PLANCK, "Moonfleet," color, CinemaScope.

PARAMOUNT

ROBERT BURKS, "To Catch A Thief," Technicolor, VistaVision

DANIEL L. FAPP, "Blue Horizons," Technicolor, VistaVision

LIONEL LINDON, "Lucy Gallant," Technicolor, VistaVision.

R.K.O.

JOSEPH LA SHELLE, "The Conqueror," Color, CinemaScope.

20TH CENTURY-FOX

LUCIEN BALLARD, "White Feather," Technicolor, CinemaScope.

MILTON KRASNER, "Desiree," color, CinemaScope.

JOE MACDONALD, "The Kneers," color, CinemaScope.

LEO TOVER, "Untamed," Technicolor, CinemaScope.

LEON SHAMROY, "There's No Business Like Show Business," color, CinemaScope.

CHARLES G. CLARKE, "Prince of Players," color, CinemaScope.

UNIVERSAL-INTERNATIONAL

WILLIAM DANIELS, "Foxfire," Technicolor, wide screen.

IRVING GLASSBERG, "Captain Lightfoot," Technicolor, CinemaScope.

GEORGE ROBINSON, "The Looters."

WARNER BROS.

ELLIS CARTER, "The River Changes," Warner Color, CinemaScope.

LEE GARMES and RUSSELL HARLAN, "Land of the Pharaohs," Warner-Color, CinemaScope.

TED MCCORD, "East of Eden," Warner-Color, CinemaScope.

WILLIAM SKALL, "The Silver Chalice," WarnerColor, CinemaScope.

HARRY STRADLING, "Helen Of Troy," WarnerColor, CinemaScope.

CHARLES LANG, "Young At Heart," Warner-Color.

HAL ROSSON, "Strange Lady In Town," Warner Color, CinemaScope.

INDEPENDENT

ROBERT SURTEES, "Oklahoma," Eastman color, Todd-AO, CinemaScope, R & H Pictures.

WILLIAM SNYDER, "Mad At The World," shooting at Republic Studios.

RUSSELL METTY, "Crashout," Hal Chester Productions.

SAM LEAVITT, "Carmen Jones," Carlyle Productions.

STANLEY CORTEZ, "Night Of The Hunter," Gregory Productions.

ERNEST LASZLO, "The Gabriel Horn," Technicolor, Cinemascope, Hecht-Lancaster Productions

TELEVISION

(The following directors of photography were active last month in photographing films for television in Hollywood, or were on contract to direct the photography of television films for the producers named.)

LUCIEN ANDRIOT, "Where Were You?," Keo Murray Productions. "It's a Great Life," Rhydic Corp'n, "The Life of Riley," Hal Roach Studios.

JOSEPH BIROC, "Treasury Men in Action," American National Studios, Inc., and "Dear Phoebe," Dear Phoebe Productions

WILLIAM BRADFORD, "Gene Autry," Flying A Productions.

NORBERT BRODINE, "The Loretta Young Show," Lewislor Ent

FLOYD CROSBY, "Royal Canadian Mounted Police," S & S Films, Ltd.

ROBERT DE GRASSE, "Make Room For Daddy," Marterto Prods., Inc., and "The Ray Bolger Show," B & R Ent.

GEORGE DISKANT, "Four Star Theatre," Four Star Productions, Inc.

E. B. DUPAR, "Tim McCoy Show," Mercury Int'l Pictures.

ELLSWORTH FREDERICKS, "The Dennis Day Show," Denmac Productions.

HENRY FREULICH, "Captain Midnight," Screen Gems.

KARL FREUND, "Willy" and "December Bride," Desilu Productions, Inc

FREDERICK GATELY, "Mayor of the Town," Rawlins Grant, Inc., and "Big Town," Gross-Krasne, Inc

AL GILKS, "The Halls of Ivy," Television Programs of America, Inc

BEN KLINE, "Fireside Theatre," "An Argument With Death," Frank Wisbar Prods

JACK MACKENZIE, "Public Defender," Hal Roach, Jr., Productions.

ERNEST W. MILLER, "Rocky Jones, Space Ranger," Roland Reed Productions, and 'Stu Erwin Show," Roland Reed Productions.

NICK MUSURACA, "The Lone Wolf," Gross-Krasne, Inc., and "Lineup," Desilu Prods., Inc

KENNETH PEACH, "Adventures of the Falcon," Federal Telefilm, Inc.

ROBERT PITTACK, "The Lone Ranger," CM TV Productions, Inc.

JOHN L. RUSSELL, JR., "Joe Palooka," Guild Films.

WILLIAM SICKNER, "The Whistler," Lindsay Parsons Productions.

MACK STENGLER, "Liberace," "Life With Elizabeth," "Florian Zabach Show," and "Frankie Laine Show," Guild Films.

WALTER STRENGE, "Waterfront," Roland Reed Productions, and "My Little Margie," Roach, Jr Reed Productions.

PHILIP TANNURA, "Burns And Allen Show," McCadden Corporation.

STUART THOMPSON, "Lassie," Robert Maxwell Associates.

JAMES VAN TREES, "I Married Joan," Jane Davis Enterprises and 'Hey, Mulligan," Mickey Rooney Enterprises.

HIGH-SPEED FILMING

(Continued from Page 467)

studies show a definite improvement in clearance of debris when the speed of rotation is increased from 5,000 to 10,000 rpm.

Eccentricity, evident in all but a few of the burs, causes a definite bounce as the bur cuts tooth structure. As a result, only three or four blades of an eight bladed bur actually cut, the remaining blades are not in contact with the specimen when they pass through the excavation. Ineffective cutting is observed when a steel bur is used on human enamel; the bur rapidly dulls and then chatters uselessly A carbide bur is seen to cut more enamel effectively The effect of improper design is readily observed in some carbide burs which perform very poorly even though they do not dull.

The photographic studies were combined with conventional laboratory test methods based on the weight loss of test materials when cut under controlled speeds and pressures. This combination provides a more complete approach to the study of design improvement of rotating dental cutting instruments.

RADIO CONTROLLED CINEMATOGRAPHY

(Continued from Page 451)

verted "GSAP" camera obtained from a war surplus outlet The low cost of this magazine-load camera makes it easily "expendable" in the event it is lost or badly damaged in use. Where Commercial Kodachrome film is to be used, it becomes necessary for the user to load the magazines himself, as this film is not presently supplied in magazines.

The complete radio control unit, which includes transmitter and receiver, can be purchased from any hobby shop or model supply dealer, and there are a number of makes to choose from. The one used by the writer is manufactured by Babcock Radio Engineering Company, Van Nuys, Calif., which company originally developed the equipment for the government as a means of controlling target drones used in anti-aircraft practice It sells for under fifty dollars.

The equipment is also available in kits for assembly by the user, making the overall cost considerably less.

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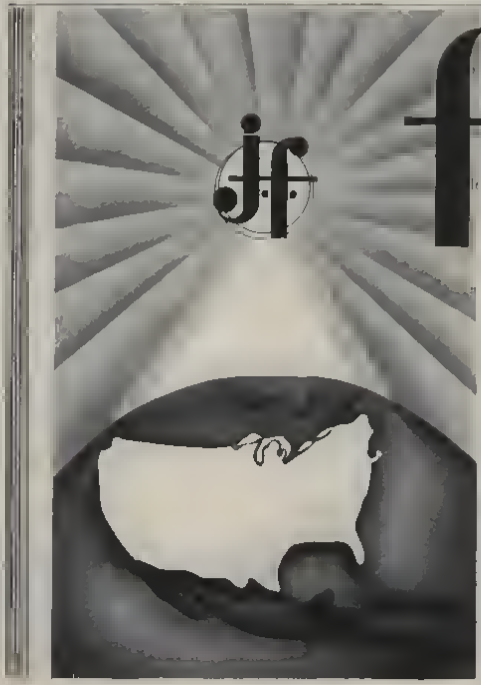

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